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Dr. Mohd Rashid Ab Hamid is an Associate Professor at the Faculty of Industrial Management (FIM). Currently he is seconded by UMP i.e. *UMP Advanced Education Sdn. Bhd.* as General Manager (Academic). He obtained his first degree [Bachelor of Science and Computer with Education (Mathematics)] from Universiti Teknologi Malaysia (UTM) in 2002 and a Masters Degree [Master of Technology Management (Human Capital Resource)] from Universiti Malaysia Pahang (UMP) in 2006. He completed his PhD (Quality and Productivity Improvement) from School of Mathematical Sciences, Faculty of Science & Technology, Universiti Kebangsaan Malaysia (UKM) in 2012. In teaching and learning, he taught several subjects including Basic Mathematics, Calculus, Mathematics for Management and Applied Statistics, Organisational Behaviour, Human Resource Management and Business Research Methods. He is interested in conducting research in his area of expertise particularly in Structural Equation Modelling (SEM) and thus far, he has successfully carried out a number of research projects in the field of applied statistics in management, medical statistics & health sciences, business and education.

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# DATA COLLECTION AND ANALYSIS (TECHNOLOGY)

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# PREFACE

The rebranding of 8 modules has been approved by the UMP Senate in February 2016. The 8 modules comprise:

i. Philosophy of Science and Ethics in Research
ii. Research Overview
iii. Literature Review
iv. Methodology
v. Data Collection and Analysis
vi. Scientific Writing
vii. Preparation for viva-voce
viii. Conceptual Paper

8 modules are one of the Institute of Postgraduate Studies (IPS) initiatives in helping students to understand ways and means to carry out research at Master's and PhD level. There are 2 sets of 8 modules provided by IPS in accordance with the technology and engineering cluster. These 8 modules are intended to help students in conducting systematic research owing to its utmost importance in determining the effectiveness and efficiency of the research process. The 8 modules shall help students to understand the research problem and identify the areas of research. The modules also assist students on how to write a literature review in order to understand how other researchers approach, define or manage the problem to keep the research pertinent to what is current in the field. In addition, 8 modules also facilitate students to understand the methods of collecting data in an organized and controlled way to achieve valid results, analyze the data according to the considered problem and make conclusions. Therefore, IPS hopes that these modules will be able to provide some insights and benefit students in conducting research at Master's and PhD level.

INSTITUTE OF POSTGRADUATE STUDIES
UNIVERSITI MALAYSIA PAHANG

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# MODULE DESCRIPTION

This module is specially tailored to assist postgraduate students of science, engineering and technology in data collection and analysis. The content in this module is primarily focused on the applications of various statistical techniques for quantitative and categorical data. Through this course, students are able to learn and directly apply the statistical knowledge in the research or problems being studied. This module provides examples to show connections between theory and application in scientific research. The materials in this module also integrate well with computer software packages i.e. Statistical Package for Social Sciences (SPSS).

There are three chapters in this module. Chapter 1 covers the data collection which encompasses the sampling techniques and the required sample sizes for research. It also covers the data collection methods for quantitative and qualitative approaches. It also discusses on the data quality, validity and reliability of the research instrument. Next, chapter 2 primarily focuses on the statistical software used throughout this module i.e. SPSS. The reader is introduced with the basics of SPSS before analysing the data.

While, Chapter 3 proceeds with the data analysis that begins with the descriptive statistics. It continues with the inferential statistics which cover hypothesis testing, normality test, t-test, analysis of variance (ANOVA), techniques correlations, regressions and analysis of categorical data.

We hope that postgraduate students will be able to fully utilise this module in assisting them in the process of research especially in data collection and analysis.

# MODULE OUTCOME

By the end of this module, you should be able to:

1. Acquire fundamental principles of statistics.
2. Organize real life data to solve related problems especially in social sciences using appropriate statistical methodology.
3. Construct statistical analysis using appropriate software tools such as SPSS.
4. Recommend a conclusion or suggestion based on the output of the analysis.

# MODULE SUBTOPIC

- ✓ Topic 1 Data Collection
- ✓ Topic 2 Statistical Software for Analysis
- ✓ Topic 3 Data Analysis
- ✓ Conclusion
- ✓ References and Further Readings
- ✓ Glossary of Statistical Terms